

Appl. No. 09/528,697
 Reply to Office Action of March 10, 2005

IN THE CLAIMS

1-27. (Cancelled)

28. (Currently Amended) A method for transmitting signals having a wireless signal format using an RF port, ~~the RF port having a wired network interface whereby the RF port is coupled to a wired network cell controller, said RF port being configured to perform second level medium access control (MAC) functions, and further having the RF port comprising a cell controller interface,~~ a data processor and an RF module, ~~wherein the RF port is configured to perform low level medium access control (MAC) functions and wherein the wired network comprises at least one of a physical entity and a logical entity cell controller is configured to perform [high] first level MAC functions,~~ the method comprising:

[providing] receiving data packets, signals formatted according to [high] first level of MAC functions, at the RF port over the [wired network to] cell controller via said wired network cell controller interface, said signals having wireless address data and message data within a data packet addressed to said RF port;

operating said processor to provide generating wireless data signals at the processor based on the data packets, wherein the wireless data signals are of [[having]] said wireless signal format for said address data and said message data to said RF module;

operating said RF module to transmit said wireless data signals as an RF signal modulated with said wireless signal format to a mobile unit; and

operating said RF module to receive an acknowledgement signal from said mobile unit and operating said data processor to process said acknowledgement signal and to cause said RF module to retransmit said wireless data signals if said acknowledgement signal is not received.

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29. (Currently Amended) A method for transmitting signals having a wireless signal format using an RF port configured to perform second level MAC functions, wherein the RF port is configured to be coupled to a cell controller via [having] an Ethernet interface whereby the RF port is coupled to a wired network, the RF Port further having and comprises a data processor and an RF module, wherein the RF port is configured to perform low-level MAC functions and wherein the wired network cell controller is configured to perform first [high] level [[of]] MAC functions, the method comprising:

[[providing]] receiving an Ethernet data packet, formatted according to first [high] level [[of]] MAC functions, [[to]] at said Ethernet interface, wherein said Ethernet data packet encapsulating as data encapsulates a data message having said wireless signal format;

operating said data processor to provide said data message to said RF module;

operating said RF module to transmit transmitting said data message from said RF module as an RF signal to a mobile unit; and

operating said RF module to receive an acknowledgement signal from said mobile unit; and

operating said data processor to process said acknowledgement signal; and to cause said RF module to retransmit said wireless data signals if said acknowledgement signal is not received.

30. (Currently Amended) A method as specified in Claim 29, further comprising:
operating said data processor to perform performing a cyclic redundancy computation on said data message and adding the result thereof to said data message.

31. (Cancelled) A method as specified in Claim 29 further comprising
operating said data processor to control said radio module.

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32. (Currently Amended) A method for receiving signals having a wireless signal format including wireless address data and message data at an RF port, the RF port having a ~~wired network cell controller~~ interface whereby the RF port is coupled to a ~~wired network cell controller~~, and the RF port further having a data processor and an RF module, wherein the RF port is configured to perform only [low] second level MAC functions, the method comprising:

~~operating said RF module to receive~~ receiving RF signals having said wireless signal format at the RF module from a mobile unit;

converting the RF signals into wireless data signals at the RF module;

~~operating said data processor to receive~~ receiving wireless data signals at the data processor from said RF module; and

converting the wireless data signals into data signals at the data processor;

provide providing data signals to said ~~wired network cell controller~~ interface from said data processor, wherein said data signals comprise [[comprising]] a data packet having a source address corresponding to said RF port ~~formatted according to higher level MAC functions on said wired network, said data packet including said wireless address data and said message data;~~ and

~~operating said data processor to cause said RF module to send an acknowledgement signal to said mobile unit.~~

33. (Currently Amended) A method for receiving RF message signals having a wireless signal format including address data and message data using an RF port ~~the RF port having~~ comprising an Ethernet interface which couples [[whereby]] the RF port ~~is coupled~~ to a cell controller, ~~wired network and the RF port further having~~ a data processor and an RF module, wherein the RF port is configured to perform only [low] second level MAC functions, the method comprising:

receiving said RF message signals from a mobile unit in said RF module;

providing said RF message signals as data signals to said data processor;

~~operating said data processor to interpret~~ interpreting address data in said data signals at said data processor;

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in dependence on said address data, encapsulating said RF message data and address data in an Ethernet packet; and

providing said Ethernet packet to said Ethernet interface formatted according to [higher] first level MAC functions on said cell controller wired network, and
~~operating said data processor to cause said RF module to send an acknowledgement signal to said mobile unit.~~

34. (Cancelled) ~~A method as specified in Claim 33 wherein said data processor is operated to encapsulated said address data in said Ethernet packet.~~

35. (Currently Amended) A method as specified in Claim 33, further comprising:
~~wherein said data processor is further operated to perform~~ performing a cyclic redundancy computation on said message data at said data processor; and
~~to compare the result thereof~~ comparing a result of the cyclic redundancy computation with corresponding data received in said data signals.

36. (Cancelled) ~~A method as specified in Claim 33, further comprising:~~
~~operating said data processor to control said radio module.~~

37-58. (Cancelled)

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59. (Allowed) A system for providing wireless data communications between mobile units and a wired network operating according to a wireless data communications protocol having higher level media access control functions, including association and roaming functions, and lower level media access control functions, including packet acknowledgement functions, comprising:

a plurality of RF ports, having at least one data interface, a radio and a control unit, said RF ports being arranged to receive formatted data signals at said data interface and transmit corresponding RF data signals according to said wireless data communications protocol, and arranged to receive RF data signals having said wireless data communications protocol and provide corresponding formatted data signals at said data interface, said RF ports being further arranged to perform at least some of said lower level media access control functions, including said packet acknowledgement functions; and

at least one cell controller, arranged to receive data signals from said wired network, to format said data signals and to provide formatted data signals to said data interface of RF ports connected to said cell controller, and to receive formatted data signals from said connected RF ports and to provide data signals to said wired network,

said cell controller being further arranged to perform at least some of said higher level media access control functions for all of said connected RF ports, including association of mobile units with one of said RF ports.

60. (Previously Presented) The method of claim 28 wherein the wireless signal format and the MAC functions are defined according to the IEEE 802.11 standard.

61. (Previously Presented) The method of claim 29 wherein the wireless signal format and the MAC functions are defined according to the IEEE 802.11 standard.

62. (Currently Amended) A method as specified in Claim 61 further comprising:
~~operating said data processor to perform~~ performing a cyclic redundancy computation on said data message; and
adding the result of the cyclic redundancy computation ~~[[thereof]]~~ to said data message.

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63. (Cancelled) ~~A method as specified in Claim 61 further comprising:
operating said data processor to control said radio module.~~

64. (Previously Presented) The method of claim 32 wherein the wireless signal format and the MAC functions are defined according to the IEEE 802.11 standard.

65. (Previously Presented) The method of claim 33 wherein the wireless signal format and the MAC functions are defined according to the IEEE 802.11 standard.

66. (Currently Amended) A method as specified in Claim 65, further comprising:
operating [wherein] said data processor to encapsulate ~~is operated to encapsulated~~ said address data in said Ethernet packet.

67. (Currently Amended) A method as specified in Claim 65, further comprising:
~~wherein said data processor is further operated to perform~~ performing a cyclic redundancy computation on said message data at said data processor; and
~~to compare the result thereof~~ comparing a result of the cyclic redundancy computation
with corresponding data received in said data signals.

68. (Cancelled) ~~A method as specified in Claim 65, further comprising operating said data processor to control said radio module.~~

69. (Allowed) The system of claim 59 wherein the wireless data communications protocol is the IEEE 802.11 standard protocol.

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70. (New) A method of implementing a protocol having higher level media access control (MAC) functions and lower level MAC functions, comprising:

performing at least some of said lower level MAC functions at a plurality of RF ports;
and

performing at least some of said higher level MAC functions at a cell controller for said RF ports coupled to said cell controller.

71. (New) The method of claim 70, wherein the lower level MAC functions comprise packet acknowledgement functions.

72. (New) The method of claim 70, wherein the higher level MAC functions comprise association and roaming functions.

73. (New) The method of claim 70, wherein the protocol is the IEEE 802.11 standard protocol.

74. (New) A method of implementing a protocol having first level media access control (MAC) functions and second level MAC functions, comprising:

performing at least some of said second level MAC functions at a plurality of RF ports;
and

performing at least some of said first level MAC functions at a cell controller for said RF ports coupled to the cell controller.

75. (New) The method of claim 74, wherein the first level MAC functions comprise association and roaming functions.

76. (New) The method of claim 74, wherein the second level MAC functions comprise packet acknowledgement functions.

77. (New) The method of claim 74, wherein the protocol is the IEEE 802.11 standard protocol.

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78. (New) A method, comprising:
formatting data packets according to first level medium access control (MAC) functions at a cell controller configured to perform said first level MAC functions;
receiving the data packets formatted according to first level of MAC functions at an RF port from the cell controller via a cell controller interface, wherein the RF port is configured to perform said second level MAC functions; and
generating wireless data signals formatted according to second level of MAC functions at the RF port based on the data packets formatted according to first level of MAC functions.

79. (New) The method of Claim 78, further comprising:
transmitting said wireless data signals to a mobile unit from said RF port as an RF signal.

80. (New) The method of Claim 79, further comprising:
waiting to receive an acknowledgement signal at the RF port from said mobile unit; and
processing said acknowledgement signal at said RF port; and
retransmitting said wireless data signals if said acknowledgement signal is not received.

81. (New) The method of claim 78, wherein the lower level MAC functions comprise packet acknowledgement functions.

82. (New) The method of claim 81, wherein the higher level MAC functions comprise association and roaming functions.

83. (New) The method of claim 82, wherein the protocol is the IEEE 802.11 standard protocol.

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84. (New) A method, comprising:
formatting an Ethernet data packet according to first level of MAC functions at a cell controller, wherein said Ethernet data packet encapsulates a data message having a wireless signal format;
receiving the Ethernet data packet at an RF port over an Ethernet interface; and
performing second level MAC functions at the RF port to generate said data message based on the Ethernet data packet.

85. (New) A method as specified in Claim 84, further comprising:
transmitting said data message from said RF port as an RF signal to a mobile unit;
receiving an acknowledgement signal from said mobile unit at said RF port;
formatting said acknowledgement signal at said RF port; and
retransmitting said wireless data signals if said acknowledgement signal is not received.

86. (New) A method as specified in Claim 84, further comprising:
performing a cyclic redundancy computation on said data message; and
adding the result of said cyclic redundancy computation to said data message.

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87. (New) A method, comprising:
receiving RF signals having a wireless signal format at an RF port from a mobile unit, wherein the wireless signal format includes wireless address data and message data, said RF port being configured to perform second level MAC functions;
converting the RF signals to data signals at the RF port;
providing the data signals from the RF port to said cell controller over a cell controller interface, said cell controller being configured to perform first level MAC functions.

88. (New) A method, comprising:
receiving RF message signals from a mobile unit at an RF port, said RF message signals having a wireless signal format including address data and message data, and said RF port configured to perform second level MAC functions;
performing second level MAC functions on said RF message signals to format said RF message signals into data signals and encapsulating said message data and address data at said RF port to generate an Ethernet packet;
providing said Ethernet packet to an Ethernet interface which couples the RF port to a cell controller; and
formatting said Ethernet packet according to first level MAC functions at said cell controller.

89. (New) The method of Claim 88, further comprising:
sending an acknowledgement signal from said RF port to said mobile unit.

90. (New) The method of Claim 88, further comprising:
performing a cyclic redundancy computation on said message data at said RF port; and
comparing a result of the cyclic redundancy computation with corresponding data received in said data signals.